

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR
OF SCIENCE IN NURSING**

NURU 115: MEDICAL BIOCHEMISTRY I

STREAMS: BSC (NURU)

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 07/8/2019

11.30 A.M. – 1.30 P.M

INSTRUCTIONS:

- All questions are compulsory. Ensure that all your answers are properly numbered
- Part I: Multiple choice questions (MCQ): write the correct answer on the space provided in the answer booklet. Each MCQ one mark
- Part II: Short answer questions – Answer questions following each other on the answer booklet
- Part III: Long answer questions: Answer each question on the answer booklet

PART I: MCQ (10 MARKS)

1. Most of the amino acids found in human body are
 - (a) L-isomers
 - (b) D-isomers
 - (c) D and L-isomers
 - (d) Optical isomers

2. A competitive inhibitor used in hypertension is
 - (a) Malonate
 - (b) Allopurinol
 - (c) Captopril
 - (d) Oxaloacetate

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3. O-glycosidic bond is formed
 - (a) When a sugar reacts with acid
 - (b) When sugar reacts with alkali
 - (c) When an anomeric carbon of sugar reacts with an alcohol
 - (d) When an anomeric carbon of sugar reacts with an acid

4. All of the following statements are correct for biological buffers. Except
 - (a) Buffers resist change in pH on addition of an acid or alkali
 - (b) Buffers consists of a mixture of a weak acid and its conjugate base
 - (c) Buffers must have minimal effects on the dissociation from changes in temperature and concentration
 - (d) Buffers should be insoluble in water

5. A symporter
 - (a) Move solute molecules in opposite direction
 - (b) Moves solute molecules in same direction
 - (c) Depends on energy
 - (d) Moves only one solute molecule

6. Protein kinases phosphorylate proteins only at certain hydroxyl groups on amino acid side chains. Which of the following groups of amino acids all contain side chain hydroxyl groups?
 - (a) Aspartate, glutamate, and serine
 - (b) Serine, threonine, and tyrosine
 - (c) Threonine, phenylalanine, and arginine
 - (d) Lysine, arginine, and proline

7. Which one of the following is not among the six internationally accepted classes of enzymes?
 - (a) Polymerases
 - (b) Ligases
 - (c) Hydrolases
 - (d) Oxidoreductases

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8. Cleavage of the _____ between either the _____ and phosphates or the _____ and phosphates releases the same amount of energy, approximately -7.3 kcal/mole (-30.5 kJ/mole).
- (a) Phosphoanhydride bonds
 - (b) Phosphoester bonds
 - (c) Glycosidic bonds
 - (d) Phosphodiesterase bonds
9. Which of the following eicosanoids is involved in mediating immediate hypersensitivity reactions?
- (a) Lipoxins (LX)
 - (b) Leukotriene (LTA)
 - (c) Thromboxane (TXA)
 - (d) Prostaglandins (PG)
10. Phenelzine is powerful antidepressant that irreversibly inhibits
- (a) Xanthine oxidase (XO)
 - (b) Catecholamine-O-methyltransferase (COMT)
 - (c) Phenylalanine hydroxylase (PAH)
 - (d) Monoamine oxidase (MAO)

PART II: SHORT ANSWER QUESTIONS (30 MARKS)

1. Draw Fischer configuration formulae of D- and L- isomers of fructose and mannose? [4 marks]
2. Explain lipid peroxidation. Name diseases associated with lipid peroxidation. [5 marks]
3. Name the ring present in cholesterol. Write biologically important compounds derived from cholesterol [5 marks]
4. Name sugar present in milk and draw its Haworth projection formula. [4 marks]
5. Name salient features of fluid mosaic model of biomembranes. [4 marks]

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6. Name four (4) pyrimidine nucleoside analogs and explain their clinical importance. [4 marks]
7. Many human diseases, including cancer, diabetes, cystic fibrosis and Alzheimer's disease, are characterized by regulatory dysfunctions triggered by pathogenic agents or genetic mutations. Briefly describe mechanism of enzyme regulation in the body. [4 marks]

PART III: LONG ANSWER QUESTIONS (30 MARKS)

1. (a) Give the structure of Hyaluronic acid and describe its biological significance. [10 marks]
- (b) Explain why corticosteroids and cephalosporins are used to treat rheumatoid arthritis caused by bacterial infection. [5 marks]
2. (a) Discuss the structural level organization of proteins [10 marks]
- (b) What are the functions of amino acids? [5 marks]
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